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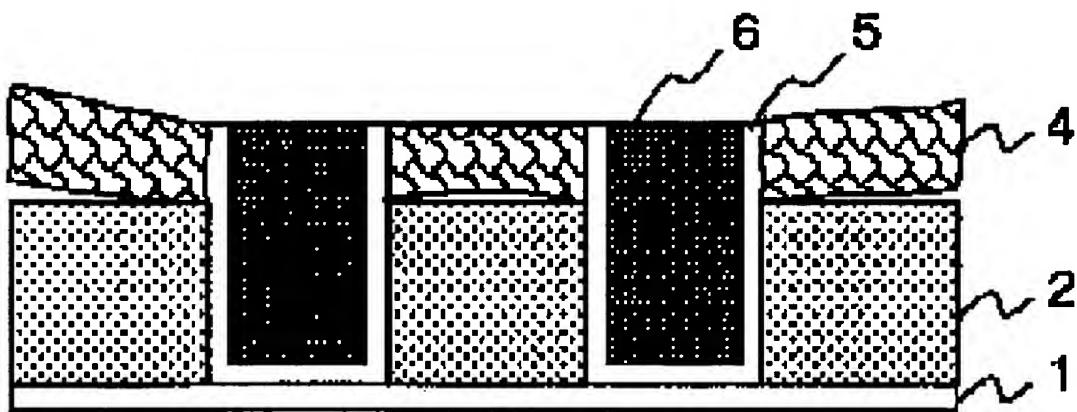
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Title: SEMICONDUCTOR
DEVICE AND METHOD FOR
MANUFACTURING SAME
Inventor(s): Tatsuya USAMI et al.
DOCKET NO.: 029437-0103

FIG. 1



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FIG. 2

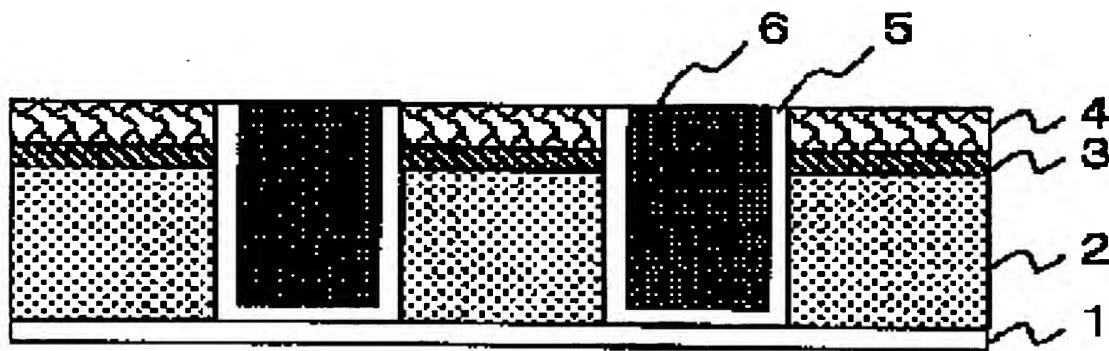


FIG. 3

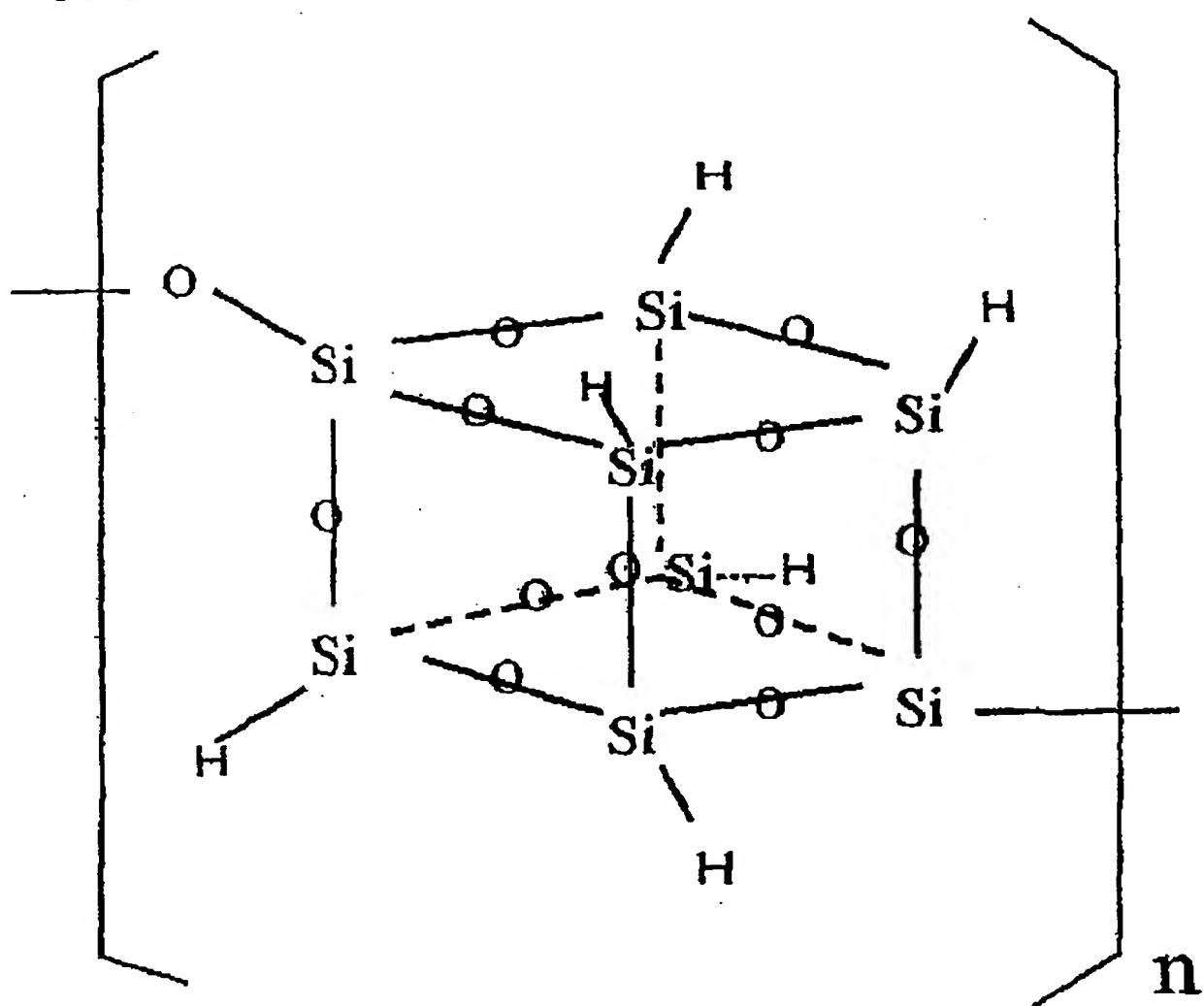
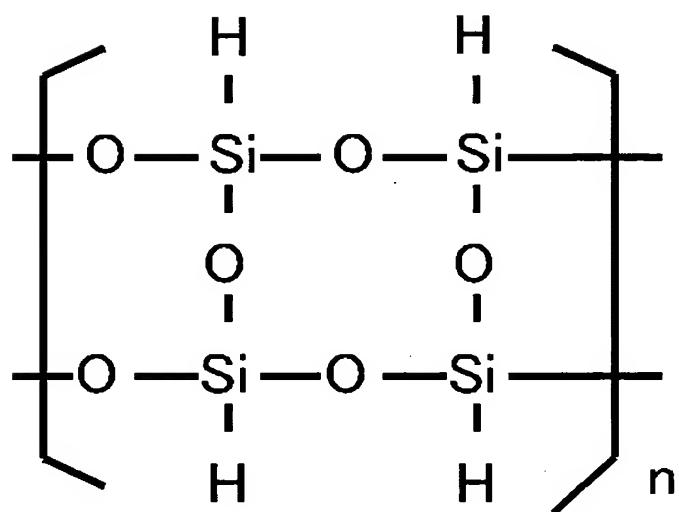


FIG. 4



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FIG. 5

DIELECTRIC CONSTANT (at 1 MHz)	2.9
REFRACTIVE INDEX (at 633 nm)	1.39
STRESS (dyne/cm ²)	7.00 X 10 ⁸
HARDNESS (GPa)	0.9
ELASTICITY (GPa)	6
THERMAL EXPANSION COEFFICIENT (ppm/deg-C)	18
GLASS TRANSITION TEMPERATURE (deg-C)	NA
THERMAL CONDUCTIVITY (W/mK, at 25 deg-C)	0.31

FIG. 6

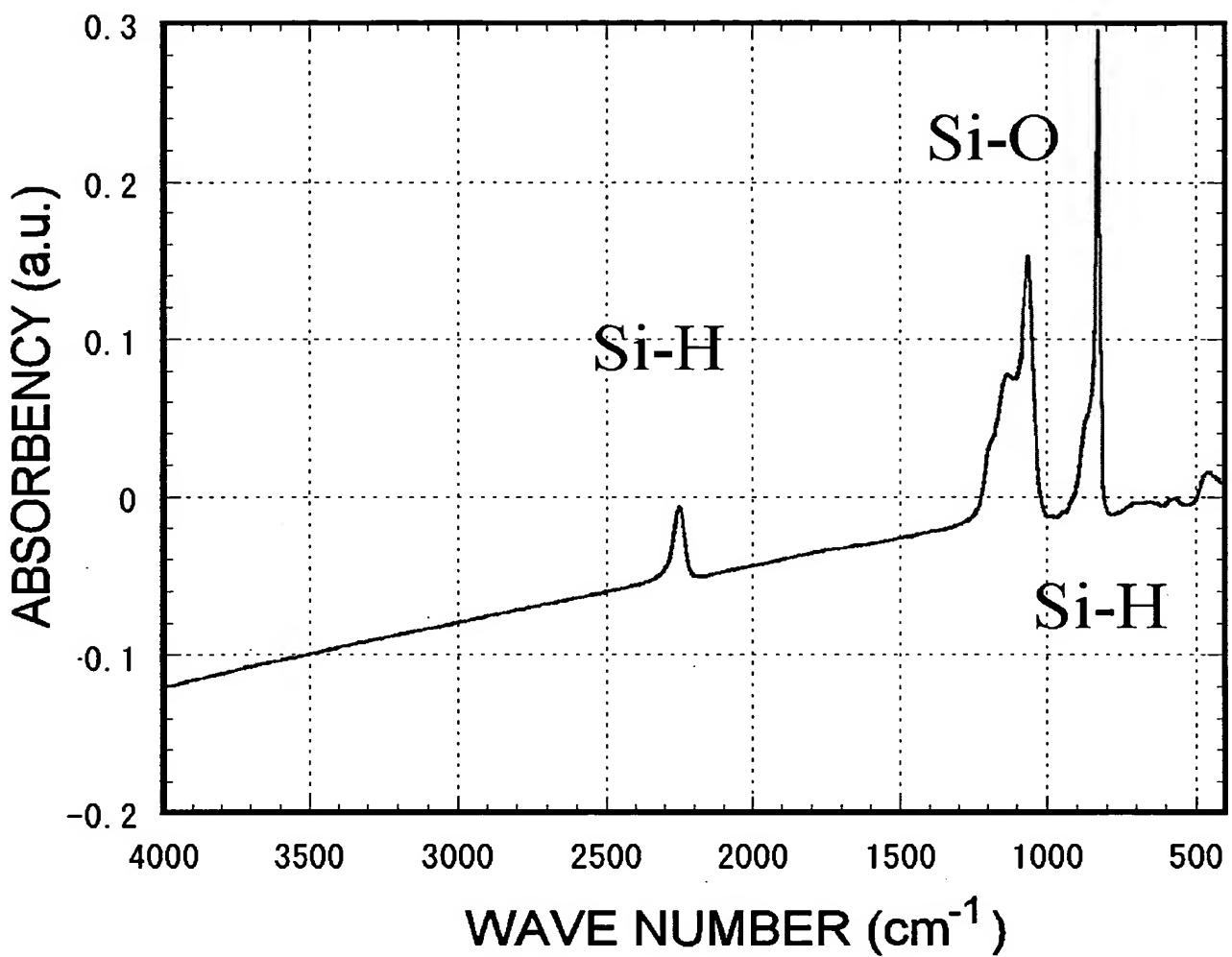


FIG. 7

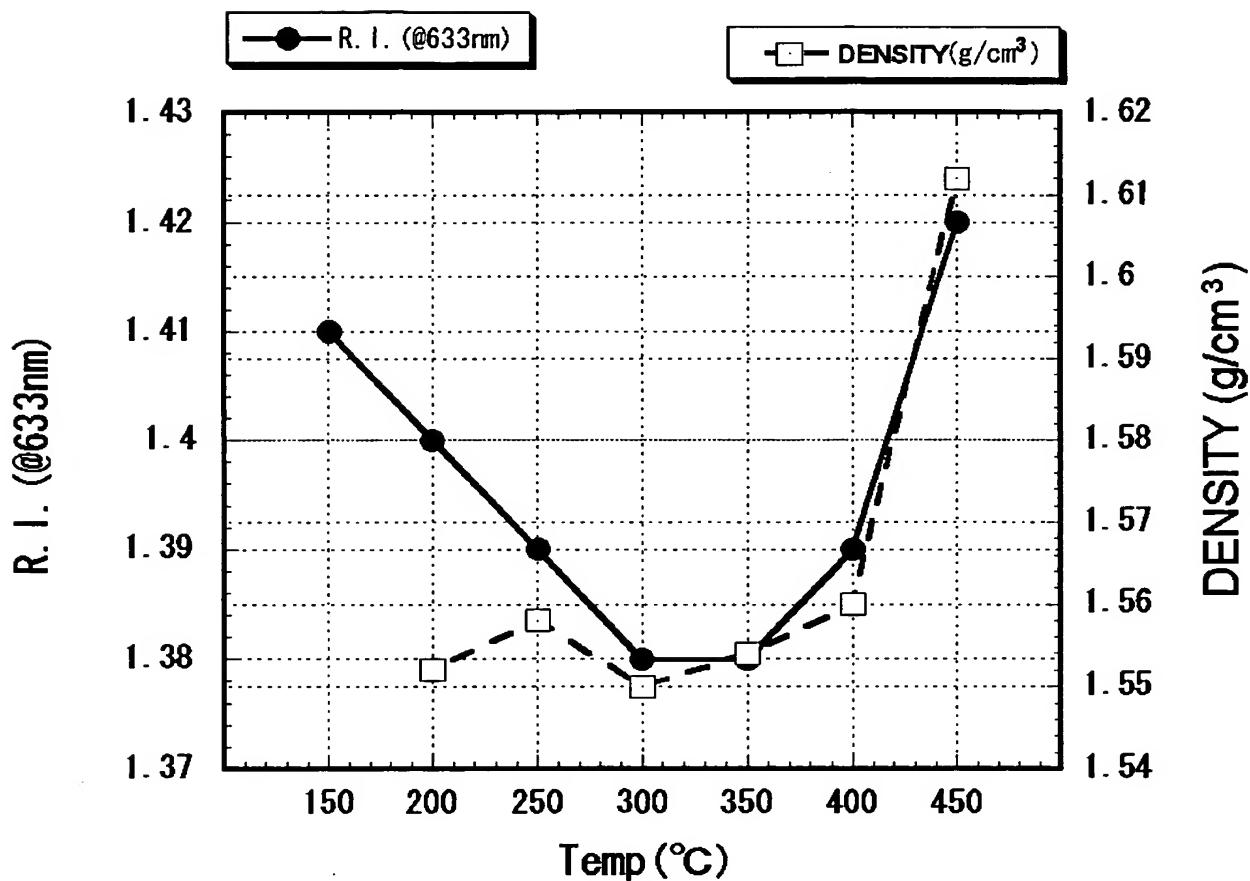


FIG. 8A

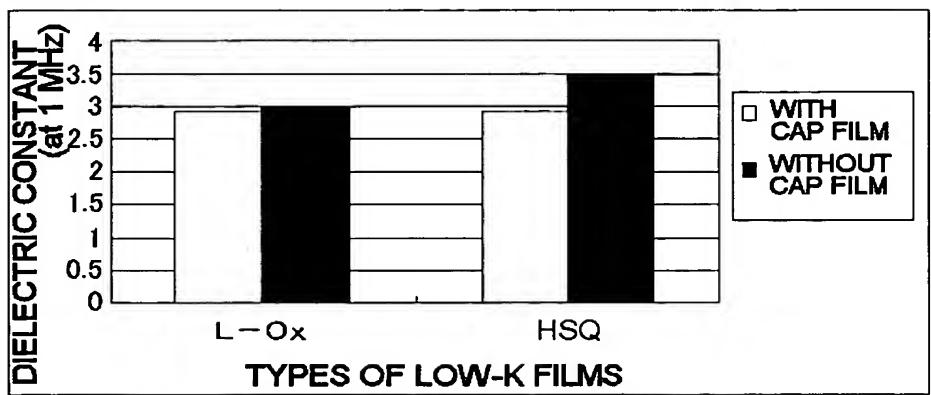


FIG. 8B

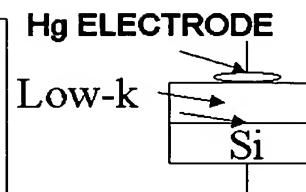


FIG. 8C

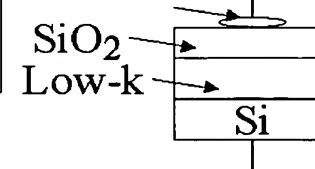


FIG.9A

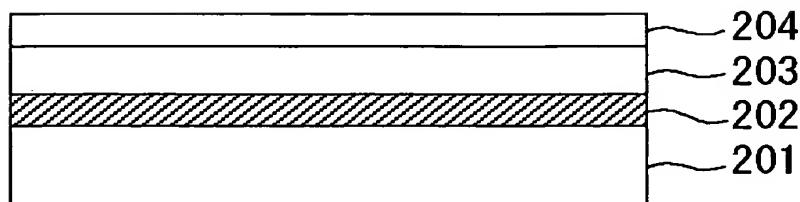


FIG.9B

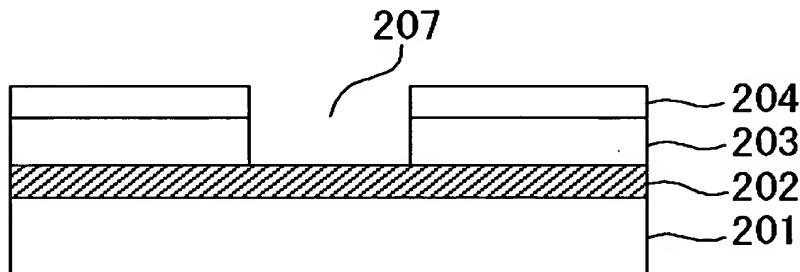


FIG.9C

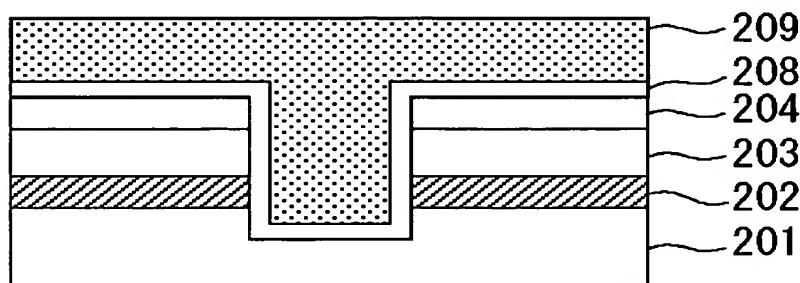


FIG.9D

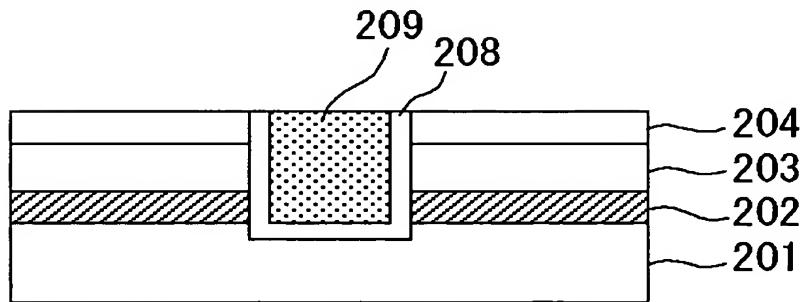


FIG.10

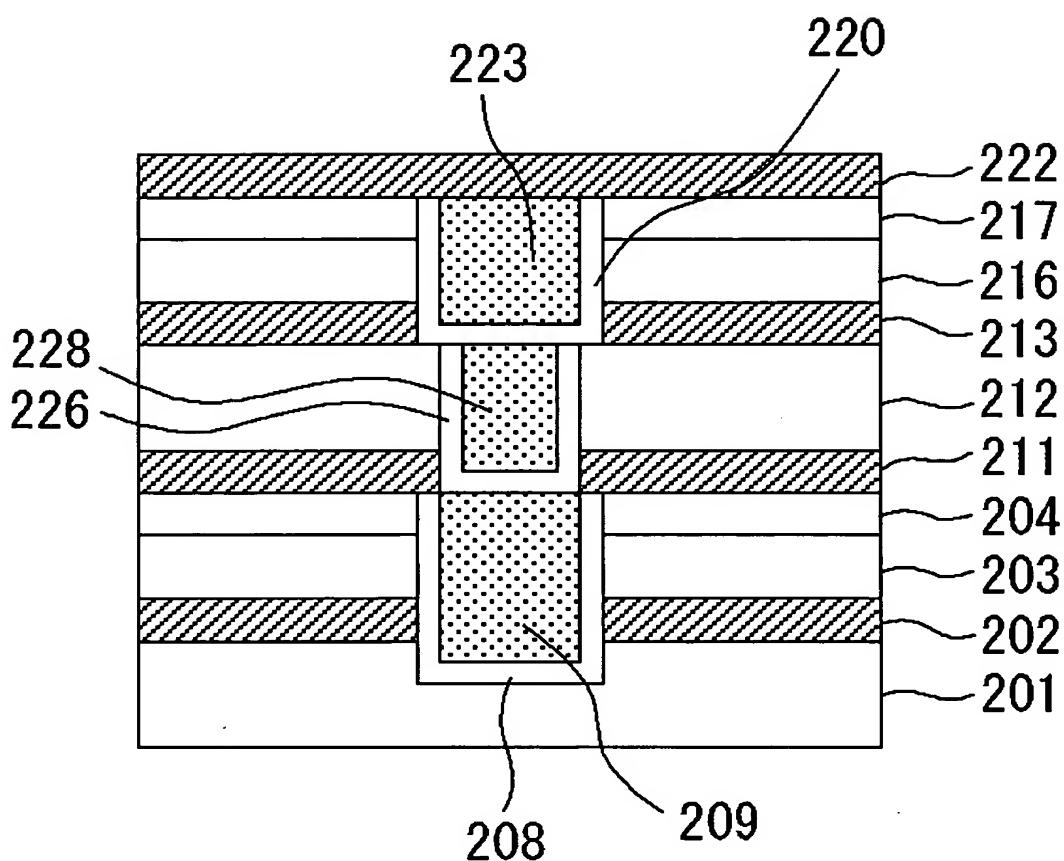


FIG.11A

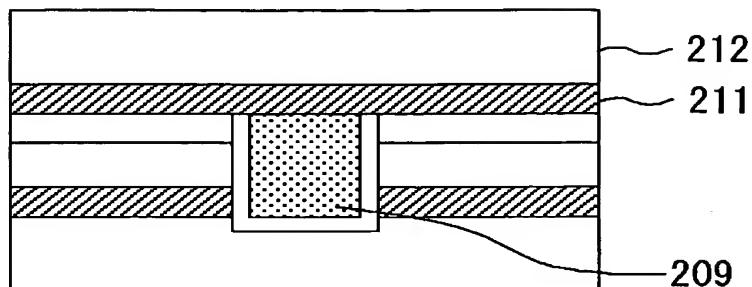


FIG.11B

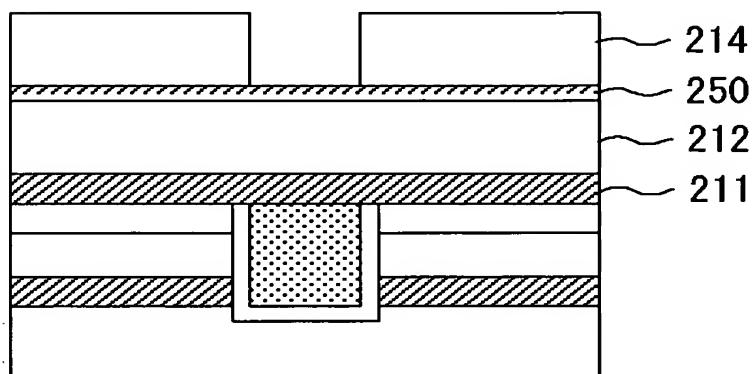


FIG.11C

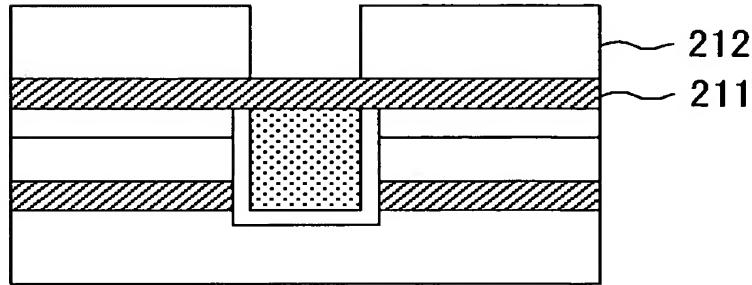


FIG.11D

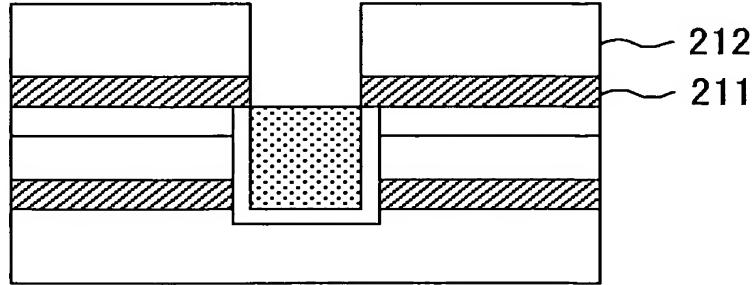


FIG.12E

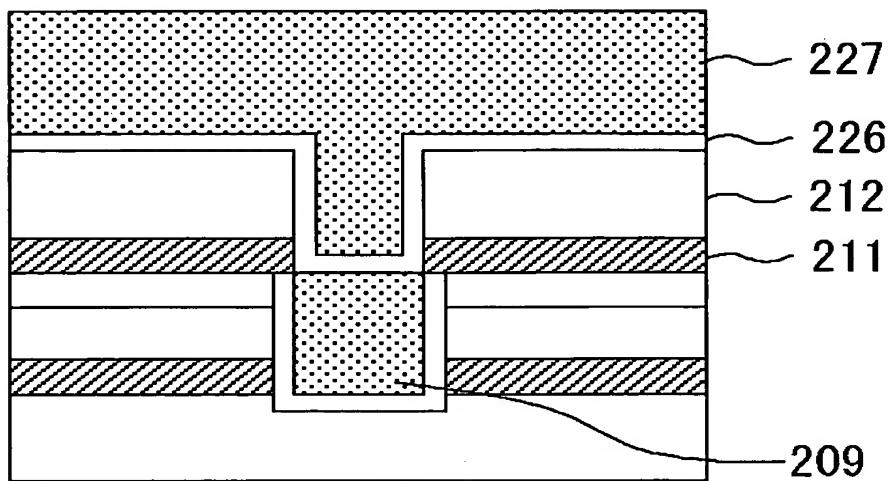


FIG.12F

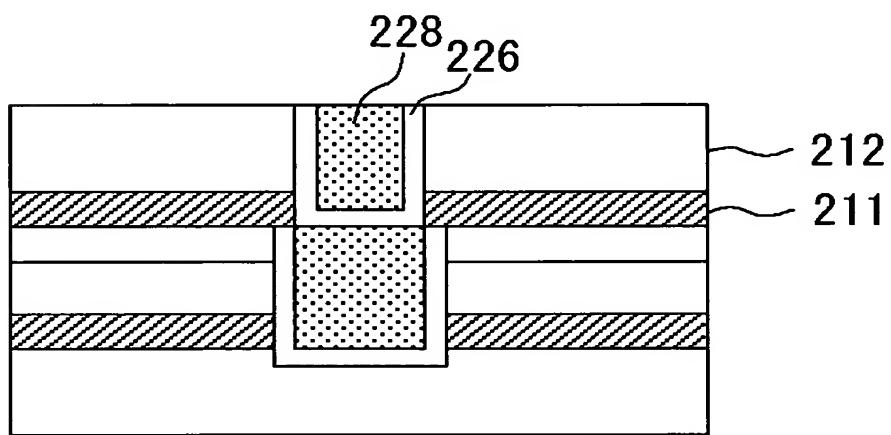


FIG.12G

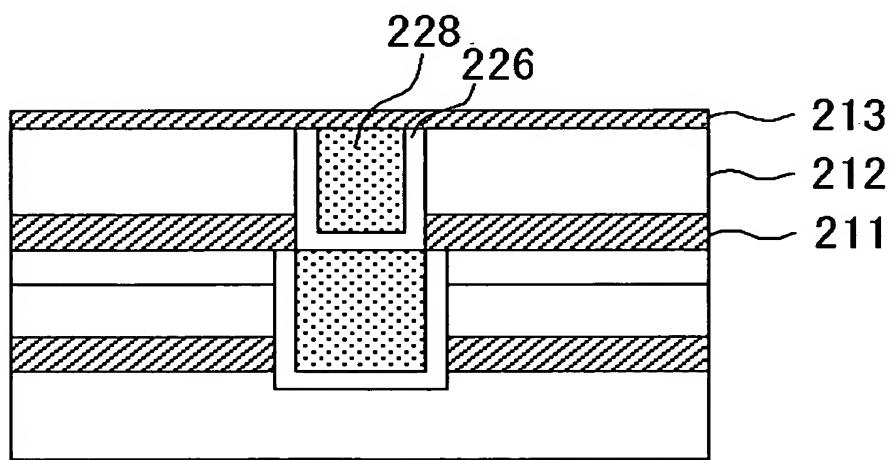


FIG.13H

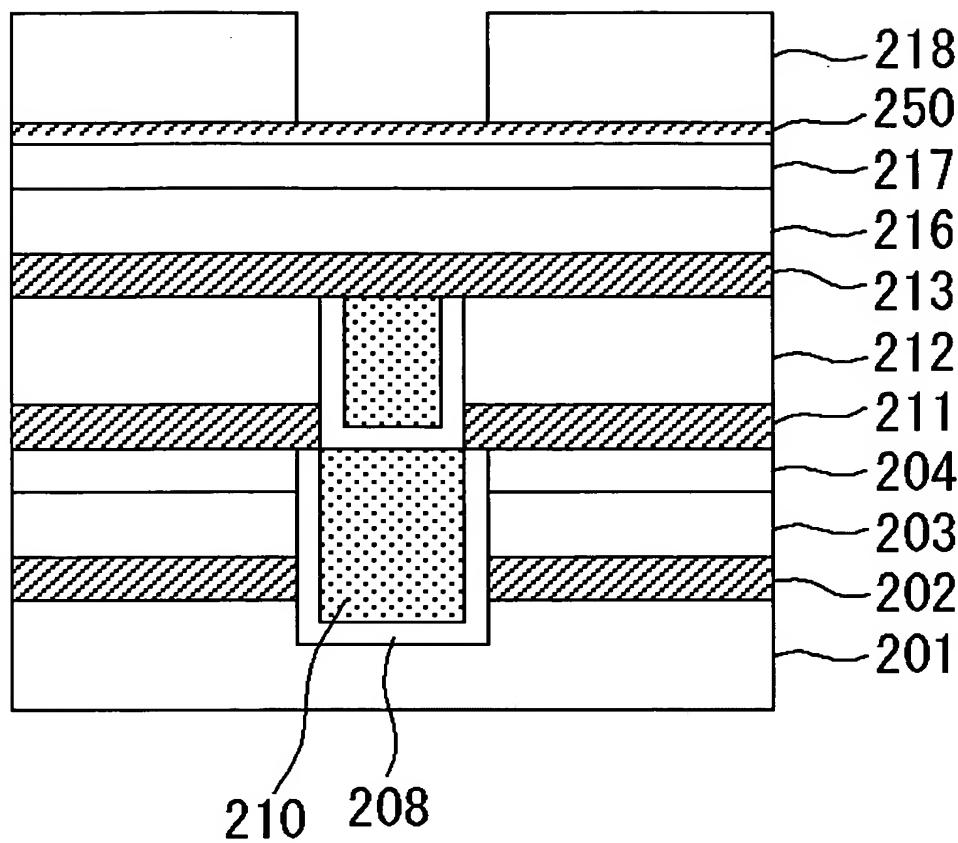


FIG.13I

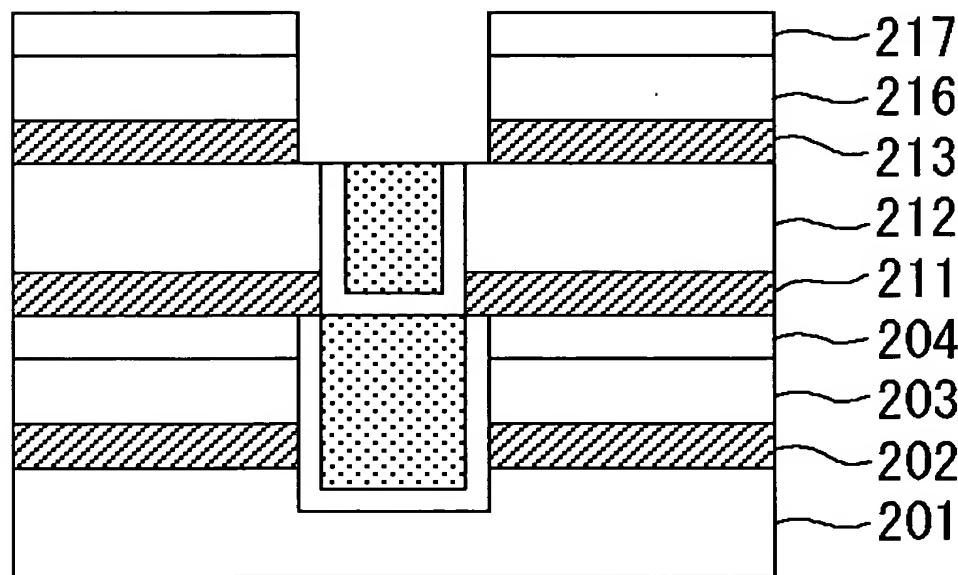


FIG.14J

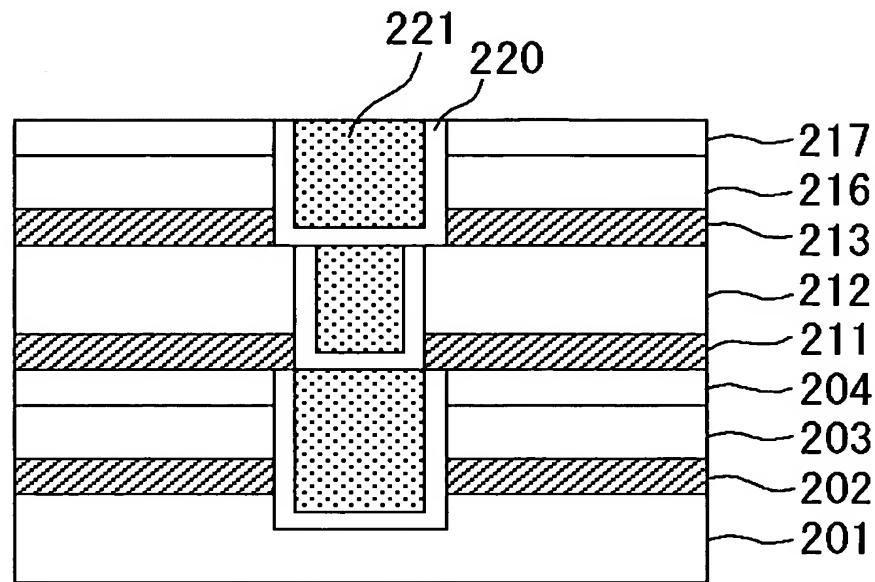


FIG.14K

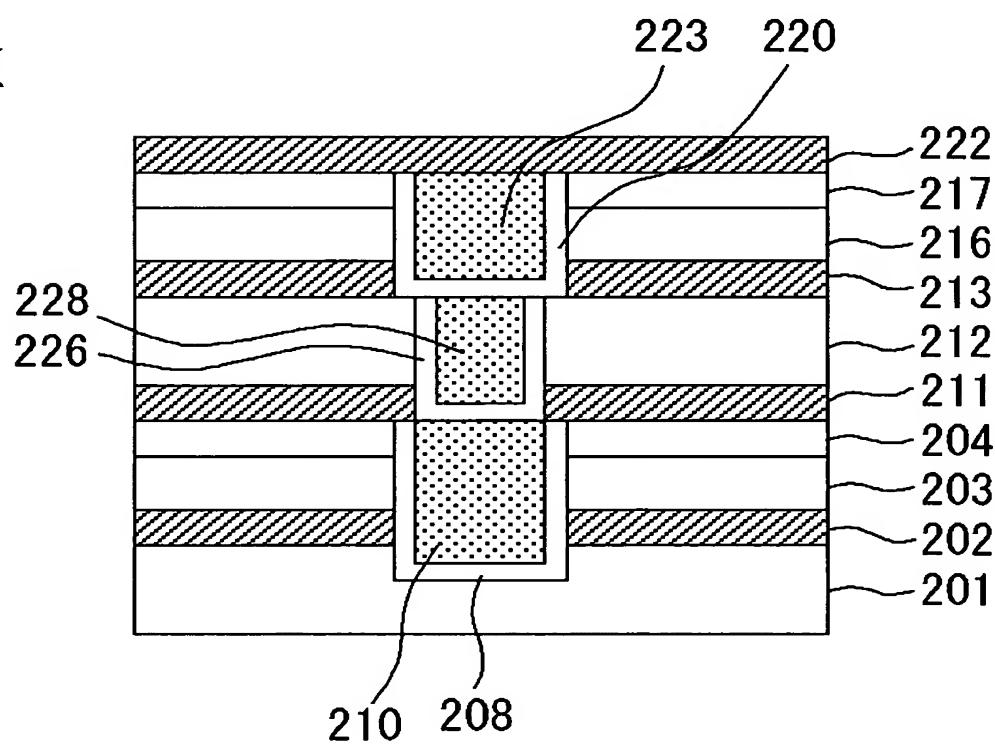


FIG.15

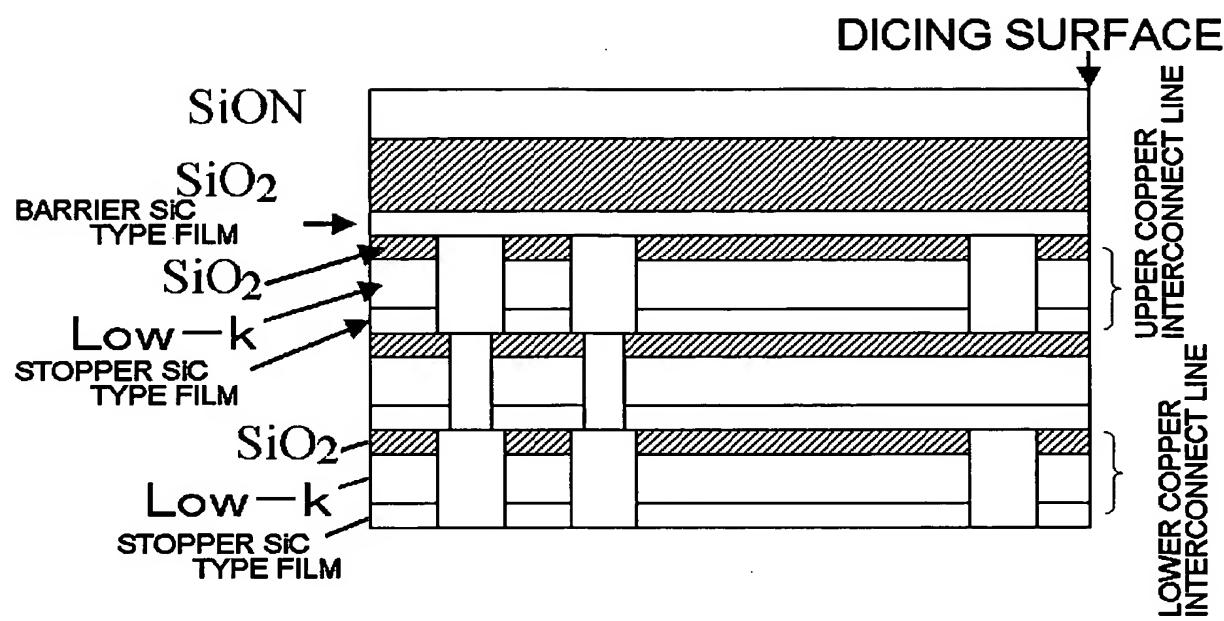
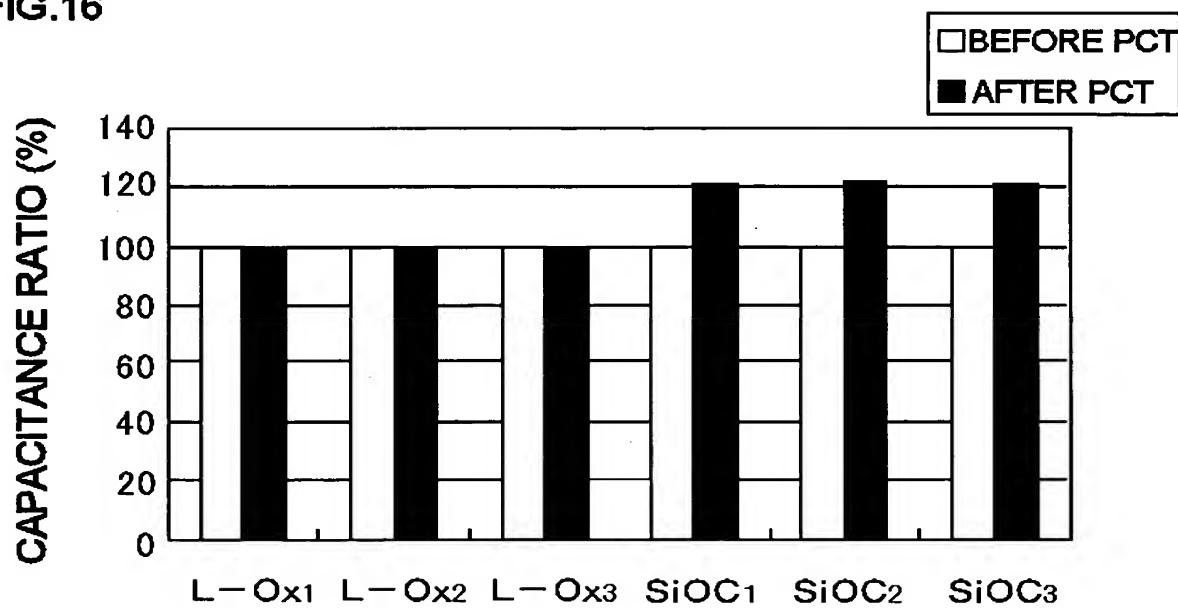
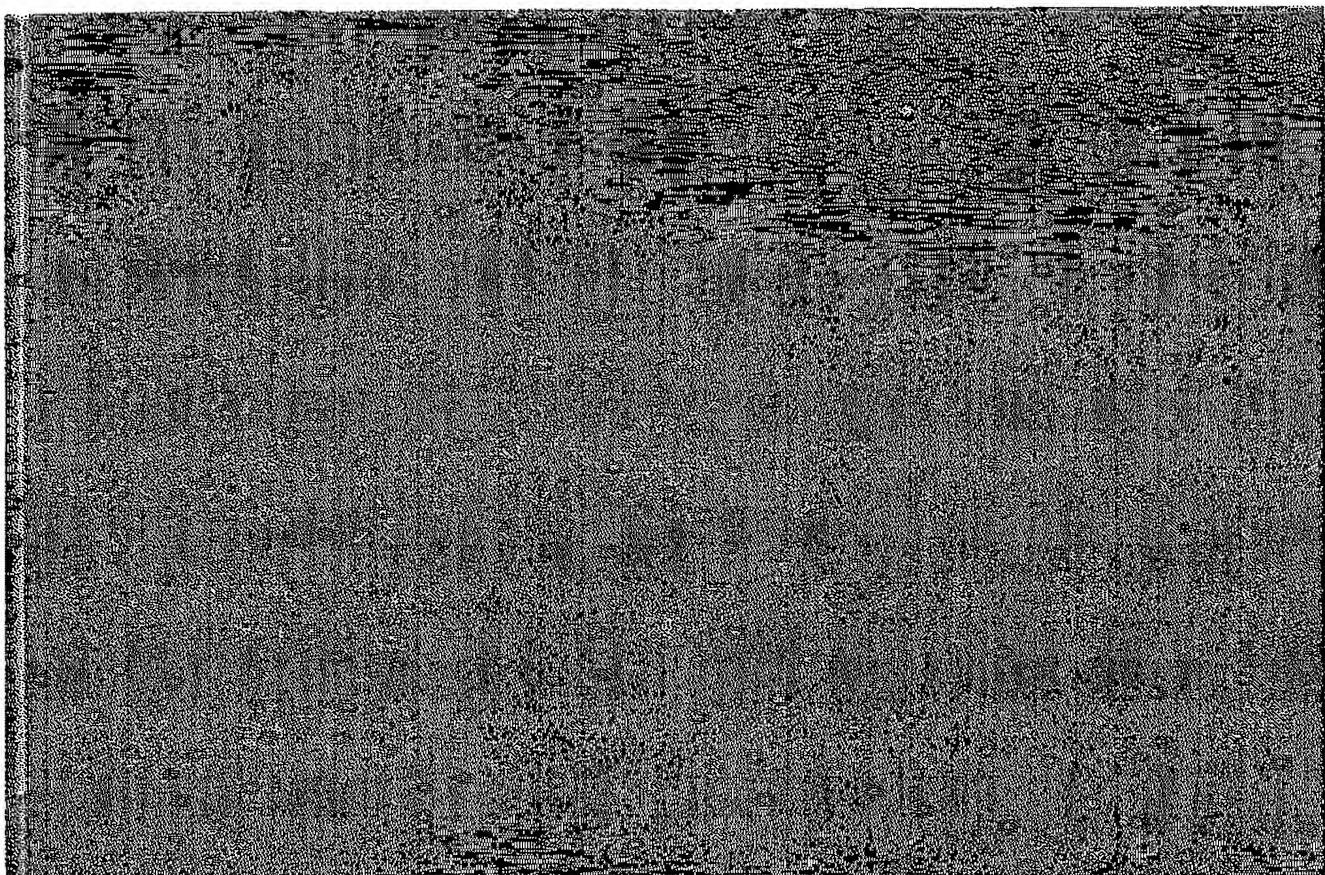


FIG.16



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FIG. 17



← →
0.75mm

FIG. 18A

	UPPER FILM			
	SiO ₂ (i)	SiO ₂ (ii)	SiCN	SiCN (CMP)
SiOC	×	×	○	○
POLYPHENYLENE	×	NO DATA	○	○
L-Ox TM	○	NO DATA	○	○
POROUS L-Ox TM	○	NO DATA	○	○
SiO ₂	NO DATA	NO DATA	○	○

FIG. 18B

	LOWER FILM
	SiCN
SiOC	×
POLYPHENYLENE	×
L-Ox TM	○
POROUS L-Ox TM	○
SiO ₂	○